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KHARKOV CITY TESTS ON THE ANNIVERSARY OF LIBERATION OF THEIR CITY

(Brief account of the work of Scientific and Scientific Research Institutes during World War II)

Editorial Board

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KHARKOV STATE UNIVERSITY named A. M. GOR'KII. (By Honored Worker of Sci
Prof A. V. Hugeny).

In the pre-war period this U was one of the oldest and largest scientific research organizations in the Ukraine. It consisted of 7 faculties containing 24 chairs, 4 scientific research institutes and astronomy observatory, a hydro-biological station and a botanical garden. Among those attending there were 3500 students and 150 aspirants.

During the last pre-war Stalin five year plan (TN: Could also imply "as a result of the Stalin Five Year Plans") the University was able to graduate more than 2000 highly qualified specialists. During that same period the University was the place for the reading of over 70 candidate's dissertations and 27 doctorates. The University published five periodicals.

During World War II and with danger to the city of Khar'kov the University was evacuated into the hinterlands of the USSR. However the associates and students of the University did not stop their work as a result of the evacuation but rather doubled their efforts at various temporary assignment in hospitals, schools factories etc. Numerous lectures were delivered.

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Members of the University did much valuable work with respect to the study of the natural resources and treasures of those portions of the Ukraine and the USSR to which they were evacuated. Many important reports were written as a result of this study: Prof S. A. Semenov-Zuser (studied the history of ancient Kazakhstan up to the Stalin Period); A. K. Val'ter (scientific research work in the field of physics for the benefit of Kazakhstan industries); Docent A. T. Lavdyov (mineral resources of Kazakhstan); Prof I. B. Volchanskiy (animal life of the Kyzyl-Uraz Oblast 65.30E 44.40 N and its National-Economical Significance).

The educational and scientific research work of the associates of the University also continued. A number of texts for middle and higher schools were prepared: Prof M. M. Pakul' (Struggle of the Czech people for their independence); Prof S. A. Semenov-Zuser (Prince Svyatoslav); Docent I. D. Boyko (Maksim Zaliznyak); Docent S. M. Shakhovskiy (Text on Ukrainian literature for the 8th the Grades of middle schools); Prof Ye. S. Khotinskiy Course in Stereochemistry for students of the 5th course, Course in Chemical Methodology, and Supplement to the Course on Organic Chemistry; Honored Members of Sciences, Prof N. P. Parubashev Course on Maritime Astronomy, Course in Theoretical Mechanics.

A number of the associates of the University took direct part in the activities of some of the scientific research and educational institutions which were in the neighborhood of the evacuation location. Thus geologists of the University took part in an expedition which was organized to study heretofore unexplored parts of the Kazakh steppe, with the result that several mineral springs and lakes were discovered (salt and sulfate). In the Urals associates of the University took part in geological studies to facilitate construction for evacuated agencies and aided in the construction of factories and acted as consultants to the People's Commissariat of Armament. In

- 2 -

CONFIDENTIAL

CONFIDENTIAL

Eastern Siberia geologists completed the aerial photographing of the Trans Baikal region and based on the photographs were able to compile a geological, hydrogeological, quaternary period strata and mineral maps for this region.

Chemists of the University took part in the organization of local industry in the Kyzylordinsky Oblast, were able to manufacture several new chemical preparations, and served local population with respect to their nutritive and economical requirements. Machinery was established for the production of invertase sugar, glucose and matches. The possibility of utilizing Kyzyl-Ordinsk clays in the manufacture of soaps was studied, certain low grade aluminum ores were obtained successfully from Kyzyl-Ordinsk clays. Docent N. A. Izmaylov continued work on the production of ether oils and vitamin concentrates, Prof I. M. Anderson was able to devise a metal substitute for covering cargo cars (railroad).

University botanists were also very active. Prof M. V. Blokov and Doc Yu. N. Prokudnyy were able to produce new types of medicinal preparations from Kyzyl-Ordinsk Oblast wild plants. Corresponding Member of the Academy of Sciences Ukr SSR, Prof I. N. Pulankin developed a new simple method for the production of gelatin and also studied the nutritive and vitamin value of pine kernels. Honored Worker of Science Prof A. V. Nagorny took part in solving several problems related to the utilization of the waste products in the hunting and the fishing industries (production of gelatin, hematogen and albumin), Prof I. M. Polyakov together with associates of VIM after a period of two years of study was able to present a fairly comprehensive picture of the milder of tick encephalitis in Marym and Oyrot.

Prof T. D. Strakhov published the results of his more important works on the utilization of a desorption-gas method for the control of agricultural plant diseases and particularly for increasing the harvest of cotton in Uzbekistan. He also

- 3 -

CONFIDENTIAL

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developed a special type of store house (magaz-ozhladitel') for storage of sugar beets under conditions as found in Uzbekistan. He also published certain articles on a new principle for the utilization of gaseous and volatile toxic agents at the moment of their destruction.

Academician B. M. Sinyav continued work on explaining the function

Corresponding Member of the Ukrainian Academy of Sciences K. P. Sinel'nikov manufactured an "invisible" glass and also on problems connected with large TV screens. Prof N. P. Korolushnev conducted and continued studies on astronomy. He published four articles as a result of his studies: Reflection of light from the surface of the Moon and Mars; Determination of the brightness and tangential measurements of the 1942 Comet Tevezde 2; Determination of Albedo, coefficient of weakening and Dispersion of light in the atmosphere of the Planet; and photometric observations of the 15 August 1943 partial lunar eclipse.

Prof T. B. Strakhov was able to reveal some new data with respect to the de-generation of the forming agent of a head (wheat) thus permitting better understanding of reasons for the ripening of grains. Results of Honored worker of Science, Prof A. V. Nagoravov's work were published in "Basic Regularities of Individual Evolution, Reactions of Organisms and Microbiotics. Prof V. B. Nikitin did some rather extensive work on growth changes in the white blood in agricultural animals; Prof I. M. Polyakov did some research which lead to an understanding of the specie variations in animals due to geographical conditions. Docent P. V. Mikhaylova studied the selective pollination of tobacco, some of the basic questions of organic evolution and the hereditary characteristics of new species.

The Scientific research work of the university associates who were at Kzyl-Orda (44-40N and 65-30E) permitted the publishing of "Sbornik Trudy" having a volume of 30 printed sheets. In addition two scientific conferences were held in this town: May 1942 and January 1944.

- 4 -

CONFIDENTIAL

CONFIDENTIAL

The diversified and valuable work done by the displaced members of the Khar'kov State U resulted in the awarding of many honors to individuals of the U by the Supreme Soviet of the Kazakh SSR and the Atyl-Orda Oblast Executive Committee.

Immediately after the liberation of the city the associates of the University returned to the city and started to rebuild their laboratories and faculties. On November 1943 the University began to function in Khar'kov as before. The personnel of the U have cooperated in the reconstruction of a chemistry, biology and physics buildings as well as many laboratories, offices and a museum. At the astronomical observatory work is being completed on the installation of a meridian circle and some other basic equipment. The Zoological and Darwinism Museums opened their doors in June 1944.

At the present time associates of the U are working on the following problems: 1-apparatus for obtaining ultrashort electromagnetic waves (problems connected with radio engineering); 2-petroleum deposits of the Pol'skoy Donbass; 3-geologic regions of the Ukraine; 4-minerology of the Ukraine; 5-utilization of local clays for industrial purposes; 6-sanitary-biological and hydro-chemical characteristics of Donets waters in the Donbass region (to satisfy industrial requirements); 7- development of new types of industrially usable plants and problems of Darwinism.

In accordance with a decree of the Ukrainian State the research institutes which were active at the University in the pre-war period have been reactivated: Institute of Geology; Institute of Biology; Institute of Chemistry; Institute of Mathematics and Mechanics; Hydrobiological Station.

From the very moment of the liberation of the city the associates of the University took active part in the reconstruction of the city and its utilities. The chemists of the University developed a special type of flux for welding the blades on turbines thus expediting the return of electric power to the city. The

- 5 -

CONFIDENTIAL

CONFIDENTIAL

University has organized a special Metal Studies Laboratory in which many experiments are taking place on request of KHMZ, KHPZ, KATZ, Zavod Imeni Shevchenko, Izyum (TH: Isinir) etc. The geologists of the university completed a project "Mineral Resources of Khar'kov Oblast and their Utilization for Reconstruction work". These geologists were also able to compile a comprehensive map showing the mineral resources of the Ukraine.

KHARKOV MECHANICAL-ENGINEERING INSTITUTE (Docent N. F. Semko)

This Institute is one of the oldest higher technical schools in the USSR. During the relatively short period of the Soviet era this Institute has trained over 10,000 engineers, with the result that today there is not a single industrial activity of the USSR where some member does not represent the Institute.

In the fall of 1941 the Institute was evacuated to Krasnoufimsk, Sverdlovsk Oblast in the Urals. Great difficulties were experienced in the attempt to set up the Institute at its evacuation location.

However the work of the Institute progressed satisfactorily. At the Chair of Turbine Construction under Honored Worker of Science, Prof V. M. Makovskiy, in the pre-war period one of the first Soviet gas turbines was constructed. The experimental model for this turbine was constructed at the Khar'kov Turbo-generator Plant. In 1941 it was assembled at PodZemGas in Gorlovka but in the fall of 1941 the turbine together with all data was evacuated to Krasnoufimsk. The data was studied with resulting important information on the operations of gas turbines. The Chair at its place of evacuation continued work on the manufacture of a new type of engine, this work had already been started at Khar'kov prior to the evacuation. At Khar'kov work had also started on the designing of a new type of internal combustion engine.

- 6 -

CONFIDENTIAL

CONFIDENTIAL

The Institute lent its talents to the benefit of many local industries. At the Znamensk repair and technical plant the chair of Metal Studies (Docent V. V. Gayranek) helped in the planning of a new annealing workshop and also rendered valuable aid in the determination of efficient methods for the annealing of special steels.

At the Chair of the Technology of Machine Building (Dep of Chair Docent N. F. Senko, Asst S. A. Vorobyev) there was developed a technological process for finishing tractor parts, designing of necessary accessories and the setting up of standards for cutting and measuring devices.

At the Chair of the Technology of Metals (Dep of Chair Docent Ye. F. Sharapin) there were designed technical requirements for an annealing furnaces using wood fuel and operating on a semi-solid fuel.

At the Chair of Physics (Docent M. M. Aronov) there was designed and manufactured a magnetic defectoscope which permits the carrying out under factory conditions of mass control of quality of parts (detecting of cracks and hairline fissures).

The Chair of Internal Combustion Engines worked on problems of preliminary purification of fuels and lubricants for engines; designing equipment for the water cooling of engines which are in a stationary state; dynamics of the operation of groups of diesel-dynamos in direct connection.

The Mechanical Laboratory aided local industries by carrying out studies on metals.

In February 1944 the activities of the institute were restored to Khar'kov. Today many new laboratories have been built, and the library has a stock of over 170,000 titles. There is no doubt that the current educational plans for the year will be fulfilled (1944).

- 7 -

CONFIDENTIAL

CONFIDENTIAL

The members of the Chair of Turbine Construction are hurrying to complete plans for the construction of a special type of engine on which they are working on orders of the Council of People's Commissars, USSR.

The Chair of the Internal Combustion Engine under the supervision of Deputy of the Chair Prof Dr V. T. Izvetkov and Assistant A. A. Voronkin, is also working on a new type of engine, whose assembly is planned for some time in 1944. The budget for these two projects is in the neighborhood of one million rubles.

Deputy of the Chair of Tractor Construction Prof M. I. Kervedev is working on a new high speed tracked vehicle.

Deputy of the Chair of the Stability (Durability) of Materials Prof V. I. Plokh is attempting to solve a method for the permitting of the utilization of tension functions in the theory of rigidity. Problems of the turning of beams with transverse cross-section limited by the π and 4π area of a circle, and the bending of curved girders have significance in computing rigidity and the equipping of corresponding forms.

The Chair of Steam Boilers and Thermal Technology is working on problems of the most efficient types of shaft-mill furnaces for small steam boilers which can operate on local fuels such as humid brown coals and peat.

At the Chair of Casting Technology (Dep of the Chair Prof Ye. Ye. Parafonov) there is being solved the problem of calculating charges in casting technology and also taking into account some of the related problems such as the property of cast iron and the smelting processes. The Chair is also working on the problem of determining air expenditure during the operation of pneumatic molding equipment.

In addition to restoring the functions of the Institute the workers of the Institute were very active in aiding the restoration of the city of Khar'kov. For example as soon as the institute returned to Khar'kov it put into operation an BK-30 motor which supplied the first current for radio and telegraph requirements.

- 8 -
CONFIDENTIAL

CONFIDENTIAL

Two weeks after returning the experimental casting shops of the Institute and it was in these shops that spare parts were cast to permit the activation of Khar'kov first post-liberation electric station.

The Technical Bureau of the Institute aided 16 activities of NKLP (Peop Comm of Light Ind) in Stalinok, Zaporozh, Chernihiv and Sumsk oblasts.

Since the return of the Institute of Khar'kov it has been working closely with industry in an attempt to improve the functioning of industry. Thus the Chair of Casting equipment is conducting tests on martin furnaces and is also working on plans for the reconstruction of the casting shops at the KHMZ.

The Chair of the Technology of Machine Building is conducting work at KHTGZ on the problem of cutting the number of different operations necessary for the processing of turbine parts, primarily by improving the operation of cutting instruments.

The Chair of Tractor Building is taking active part in the restoration of the tractor pool for Khar'kov Oblast. Various problems were solved having to do with overhauling of available tractors and also worked on recommendations for the best type of tractor to be used for agricultural operations.

At the present time one of the gravest problems facing Khar'kov industries is the fact that many of the metal stock piles have been mixed up with the result that classification and grades are no longer evident. It has been the responsibility of the Mechanical, Metallographic and Chemical Laboratories of the Institute to determine the grade and classification of all the metal stocks. It is noted that the Metallographic Laboratory (Dep of the Chair Prof A. V. Tereshchenko) conducted a total of 372 tests of metals.

CONFIDENTIAL

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At the present the institute is rendering great assistance with respect to the restoration of plant laboratories and also with respect to the training of additional lab personnel. The institute has also set up a system of regular consultative aid to plants.

KHARKOV ELECTROTECHNICAL INSTITUTE (Docent A. L. Vayner)

The 14 professors (2 associate professors), 4 dr of Sci, 30 docents (26 were cand of sci) and 62 other assorted scientific workers conducted important work even throughout the war period. Their prime effort was directed toward the development of new electrical equipment for the petroleum industry which could utilize a electromagnetic type of motivating force, new high temperature electric smelting furnaces, and new methods for protecting electrical equipment from lightning. The institute was able to produce a unique lightning generator (the largest and most powerful in the USSR) which is capable of producing bolts up to 5.4 million volts.

Many of the associates of the Institute put on uniforms during the war and conducted research work under actual front line conditions. Prof Dr G. S., Col-Engineers carried out important research on magnetic mines. Bron was awarded the Order of the Fatherland War First Class and the medal "For the Defense of Sevastopol". Bron was aided in some of his research by Cand Tech Sci N. A. Babakov.

Docent I. M. Kovtun in 1942 at N Plant completed a series of very important studies on starters and generators. The results of these studies were later applied to tank production.

During 1941 and 1942 much work was done on methods for the utilization of evacuated equipment for the benefit of industry. Prof Dr P. I. Aronov and Prof A. L. Matveyev were active in this aspect of work. For example the institute was able to improve the operation of circular saws at the KHMZ. In addition Prof P. I. Aronov studied problems connected with the quenching field of generators and Prof

CONFIDENTIAL

CONFIDENTIAL

A. I. Matveyev who for many years had been studying the phenomena of electric currents put into practice many methods for the conservation of electric power, particularly as it applies in the metal cutting industry. He also supervised work conducted at the Power Engineering Institute of the Ukr Academy of Sciences on power conservation per unit item produced. Matveyev's theories were given practical application at several plants in the Urals and in Moscow. Finally the methods suggested by Matveyev for conserving power were adopted by the Commission at the Division of Industrial Power Engineering, People's Commissariat of Power Stations USSR for use by metal cutting enterprises. In addition Prof A. I. Matveyev conducted experiments in the Urals at the Power Engineering Inst, Ukr Acad Sci on rational methods for power supply for industrial enterprises.

In conjunction with the rapid expansion of electrical networks in the Urals and in Siberia many problems arose with respect to the performance of electrical networks under various climatic conditions. Much research was devoted to determining the action of electricity under conditions of permafrost soils.

Electrification of agriculture in Siberia under wartime conditions was very difficult in view of serious shortages of conducting materials. A satisfactory system was established on a 22x-volt line from Kansk to Brashnoye village (21 kilometers) where the power was carried partly by wire and partly through ground. At the present time the Institute is working on the possibility of putting the whole Kharenergo system on this two conductor (wire and ground) system.

During war time experiments were continued on work started in 1940 by Docent A. L. Vayner, Docent A. K. Potuzhniy and Docent S. M. Fertik on the problem of proper conveyance of lightning discharges through poor conducting soils. The results of this research are most important in that they will provide for the safe operation of power systems.

- 11 -

CONFIDENTIAL

CONFIDENTIAL

In the technology of large currents particularly for AC rectifiers certain disadvantages were experienced in the fact that the glass-mercury rectifiers (very critically short) had only a short life span (1000 to 2000 hours). Docent M. M. Tarashevskiy and Docent S. M. Pertik together with the late Academician V. M. Khramov worked out the manufacture of the so-called mechanical rectifier. An experimental model was constructed (100 A and 300 volts). After tests several of these new rectifiers were manufactured and they are now undergoing practical testing at one of the Ural mines. The new rectifier is light, is very efficient and has no limit as to its service life.

Many of the personnel of the Institute, during the years of evacuation worked at various electrotechnical enterprises. Some of the personnel taught at schools (VUZ), among them were Prof. A. A. Skorskhov, Prof. Dr. Ya. I. Gerasimov and Prof. Dr. V. N. Kiyanskiy.

KHARKOV CHEMICO-TECHNOLOGICAL INSTITUTE Docent S. A. KHLOV (Corr Memb All Ukr SSR
Prof S. S. Grachevskiy)

This Institute was evacuated into Chirchik, Tashkent Oblast. In two years the personnel of the Institute increased from several tens to over 400 (at the time of the return to Kharkov). The Institute graduated many qualified technicians who are already employed by defense industries (chemistry). During the two year period there were heard 12 theses for scientific degrees and 4 of these were doctorates. However personnel training was not the extent of the activities of the Institute. Members of the Institute did much research to increase the productivity of Uzbekistan industries. The following were the main themes of work at the Institutes:

- 12 -

CONFIDENTIAL

CONFIDENTIAL

- 1- Studies of local mineral resources with a view toward their utilization for the organization of new chemical industries.
- 2- development of new methods of chemical technology and the obtaining of new types of products for defense needs.
- 3- intensification and rationalization of existing defense production.

Much of the work which was conducted by personnel of the institute (evacuated) was at the Electro-chemical Combine named Stalin and other industrial enterprises of the Uzbekistan.

At the Chair of the Technology of Inorganic Materials under the supervision of Docent V. I. Atroshchenko methods were devised for intensification of processes of producing one type of defense item at the Chirchik Electro-chemical Combine named Stalin.

Docent A. N. Tseytlin assisted by Docent M. Ia. Bronnik completed a project for a new shop for the manufacture of one of the most important of chemical substances.

The Chair of the Technology of Pyrogenous Processes under the supervision of Docent E. A. Ielov and Prof G. I. Deshalit and by order of the Council of People's Commissars of Uzbek SSR conducted research on the coking and semi-coking of Central Asiatic coals. It was discovered that in the semi-coking of east-fergana coals (from Kok-Yangak) it was possible to obtain as a by-product phenols, which could be utilized in the manufacture of plastics. In addition benzene, kerosene and other valuable by-products were obtained. The Chair also worked on the problem of selecting the type of coal for semi-coking purposes to be used for metallurgical purposes at the then-in-process-of-construction Uzbekistan Metallurgical Combine.

The Chair of General Chemical Technology under the supervision of Prof M. I. Nekrich studied local sulfates with a view toward their utilization in the manu-

CONFIDENTIAL

CONFIDENTIAL

facture of alkalis. It was possible to determine a new method for the manufacture of soda, and with the aid of the chair special equipment for the industrial production of soda was designed at Fergana.

The Chair of the Technology of Organic Dyes under the supervision of Corr Memb Ukr Acad Sci, Prof P. P. Karpukhin, completed work on the synthesis of neozone- one very important product for the rubber industry (anti-aging agent for rubber). The production of neozone has been continued at the "Elektrokabel" Plant. This chair also developed a new method for the tanning of leather, which does not in any way lower the quality of the leather while at the same time lowering the utilization of critical materials. This method has already been adopted by Chirchik local industries and the Khar'kov Leather Plant.

The Chair of the Technology of Fats under the supervision of Prof G. L. Yukhnovskiy and Prof B. N. Tyutyunnikov was able to produce olefins from cotton seed oils. This is very important in view of the large demand for olefins, and the large natural cotton seed resources of Uzbekistan.

Prof B. N. Tyutyunnikov also gave much aid to the soap making plants of Uzbekistan. He devised methods for utilizing the waste of local fat rendering industries in the manufacture of soaps. The new technology was immediately adopted by the Kata-Kurganskiy and Chirchik Soap Plants.

The Chair of the Technology of Electro-Chemical Production under the supervision of Prof A. N. Sysoyev introduced the production of calcium carbide at the Chirchik Electro-chemical Combine imeni Stalin. The Chair also perfected plans for the manufacture of equipment which will be utilized in the manufacture of rock wool. Sysoyev was also responsible for devising a method for the utilization of local phosphorites for the production of phosphorus.

The Chair of the Technology of Silicates worked on the very important problem of finding substitutes for critically acute refractory materials from local raw materials.

CONFIDENTIAL

CONFIDENTIAL

By order of the government of Uzbekistan, Corresponding Member of the Ukrainian Academy of Sciences, Prof S. D. Urazovskiy and Prof N. M. Tyutyunnikov conducted work on the development of a successful chemical agent for the control of the "Komstok" worm, one of the worst agricultural pests. A special commission which was appointed declared that this newly manufactured agricultural toxic agent was the most effective one yet produced.

The workers of the scientific research activities of the Institute also conducted much valuable work. One of the most important result of their work was the manufacture of wolfram trioxide, and during the period 1942 to 1943, it plant produced 600 kilograms of the pure product which was used in the manufacture of high speed steels.

Workers of the KAPF (under the supervision of Engineer I. G. Pechnikov) worked out methods for the assembly of a complex combine for hard cutting alloys to be utilized by the N Plant.

Scientific workers of the Institute together with chemists of ChGKhK under the general supervision of the Chemical Society Lueni D. I. Kondolev (headed by Prof N. A. Valyashko) were able to establish many plans for the development of the Uzbekistan Chemical Industry on the basis of utilizing the power supplied by the Furkhad and other power stations of the republic. It was also possible to work out a concrete plan for the development of the mineral fertilizer industry in Uzbekistan. This plan has been adopted by the Uzbekistan government and is being planned for operational status in 1944.

The government of Uzbekistan has recognized the efforts of the personnel of the institute and has awarded some 17 orders of the Uzbekistan government to leading personnel of the Institute.

- 15 -

CONFIDENTIAL

CONFIDENTIAL

After the liberation of the city of Kharkov the Kharkov Chemico-Technological Institute returned to the city and the personnel of the institute took an active part in the reconstruction of the city. Shortly after going back into operations the institute was able to graduate 50 qualified engineer-technicians for the chemical industry. However this number is but a mere nothing compared to the actual requirements of the southern and Ukrainian chemical industries which in the near future will demand many thousands of such engineer-technicians.

Recently the Institute undertook a program for short term courses for the training of masters and other leader specialists for the industries of construction materials. Work has also started on the organization of short courses for laboratory technicians for the coal tar chemical (color chemical) and basic chemical industries.

It was shortly after the return of the institute to Kharkov that the Chair of the Technology of Silicates began to work on the plans for the construction of a glass factory at Artemovsk. The drawing up of the plans for the glass factory at Akhtyrka was completed in less than a month's time.

Several members of the Chair of General Chemical Technology are assigned on a temporary basis at the Kharkov Experimental Station for Low Temperature Research and have been given the task of restoring the operations of the oxygen plant. The lack of natural sources of oxygen makes it imperative that some method be devised for a steady supply of oxygen so as to permit the continued operation of the research.

The Chair of the Technology of Fats is rendering actual aid to various Kharkov industries. Professors of the chair are aiding in the reconstruction of shops at the third State Soap Plant and at the Central Laboratory of UkrFasZhirMaslo there are being prepared special soaps for disinfection and therapy of dermatological afflictions.

- 16
CONFIDENTIAL

CONFIDENTIAL

The laboratories of the Institute are giving invaluable aid with respect to the control of the quality of various industrial products. For a while after the liberation of the city most of the work which was being accomplished at the laboratories was that which was on request of the Administration of NKVD and the Staff of the MPVO. Later civilian agencies were aided by the institute. Among such agencies were: KHEMZ, ZHTV, ZHTZ, KATZ, Plant imeni Shevchenko, the KozhZavod, ATG, the "Chernomy Shlyakh" Balkhoz, Administration YUZH and many others.

KHAR'KOV AVIATION INSTITUTE imeni OSVIRNIM (Docent R. V. Pichtovnikov)

During the evacuation the educational and student complement of the Institute did valuable work among the various enterprises in the locality to which the institute was evacuated: Prof A. G. Tiktin aided N Plant in the setting up of an efficient operational procedure; Docent Ya. Ye. Tkachenko conducted research on improving the flying qualities of military planes produced by the N Plant.

Cand Tech Sci G. F. Fedel'skiy worked on the problem of determining defects in an airplane distributor. The result of the research was a 10 to 12% increase in efficiency without decrease in the degree of carburation.

Acting Chief of the Chair of the Technology of Plane Construction Docent R. V. Pichtovnikov aided N Plant in the manufacture of stamping equipment and has introduced new methods for the stamping of airplane parts.

In addition to rendering invaluable aid to industrial enterprises in the city of Kazan, much scientific research took place with the result that important research results were made available to institutes in Kazan, Khar'kov and other cities.

Prof Dr B. S. Koval'skiy (Chief of the Chair of Machine Parts and Hoisting and Transportation Equipment) completed a series of investigations prompted by the request of the Novo-Kramatorskiy Machine Building Plant imeni Stalin having as its

CONFIDENTIAL

CONFIDENTIAL

purpose the determination of the most efficient selection for gears in hoisting equipment. This new technique will be utilized in the reconstruction of the crane and hoisting equipment at the "Serp i Molot" Plant in Khar'kov.

Prof Yu. Kh. Kostyukov (Chief of the Chair of Machine Tools and Metal Cutting) has completed research on the theme "Dynamics of Cutter Wheel Milling" which was also his theses for a doctorate. The theories developed by Kostyukov have been included by Prof Reznikov in his text "Studies on Cutting of Metals" (this has been approved by VKhKh, SNU).

Engineer M. B. Tumarkin (Assistant at the Chair of the Technology of Airplane Engine Building) has completed research for and submitted his thesis for a candidate's degree on research the results of which are being utilized by airplane engine building enterprises. It has been found that methods suggested by Tumarkin have resulted in a 40% decrease in the cost of the engines while at the same time increasing production by about 60%. At the present time the new method is being utilized at many of the NKAP factories.

Engineer M. M. Lamm (Acting Chief of the Technology of Airplane Engine Building) has submitted his doctorate's dissertation "Streamlined cutters" which discussed the technique of improving the operating characteristics of metal cutters. High speed "streamlined" cutters have been manufactured from R1-1 steel at KHTZ and it was found that productivity increased up to 11 to 26%. Special tests showed that the reliability of these streamlined cutters was about 7 times as great as conventional cutters.

Engineer A. Ye. Potapenko (Assistant at the Chair of Airplane Engines) completed scientific research work on the problem of converting two cycle engines from a liquid to gas generator fuel operation. This particular work was conducted on direct request of the Power Engineering Institute, Academy of Sciences USSR.

CONFIDENTIAL

CONFIDENTIAL

Docent I. Ya. Mints at the Chair of Physics completed a series of studies which were listed in his thesis for a candidate's degree entitled "Effect of a Magnetic field on Discharge at low pressures".

Docent G. N. Kuzimenko (Acting Chief of the Chair of Chemistry) completed work "Adsorption Properties of Shar'kov Tripoli Type Clays 'Zelarka'," he was able to determine that this zeolite has better adsorption qualities than US manufactured Floridin and even the Katalpa gumbrin. This substance (zeolite) has proven itself to be an excellent substance to use in the process of regeneration motor oils etc. The discovery of this sorbent also results in a definite economy in transportation, by invalidating the necessity for transporting sorbents from distant places.

In addition to the above mentioned completed works, there are many research projects which are under way. Docent D. I. Kostyuk is in the process of completing work leading to a doctorate's thesis on the theme "Kineto-static Analysis and Synthesis of Retractable Landing Gear".

Docent L. V. Matinenko is completing work on his doctorate's thesis "Acoustic Fields in Cases of High Speed Sources of Sound". This has to do with the problem of a "noiseclass" airplane.

Prof A. G. Tiktin is also working on a doctorate's dissertation "Production Rhythm in the Mechanical Shops of Aviation Engine Building Plants". This work touches on the very important problem of continuous operations in an airplane engine plant.

UKRAINIAN SCIENTIFIC RESEARCH INSTITUTE OF METALS. NKCHS (Prof N. F. Leve)

In the pre-war period this institute was one of the largest institutes of the Ferrous Metals Commissariat and employed over 150 people. The institute has ten laboratories among them an X-Ray Lab, a Metallographic Lab, a Lab for Mechanical testing etc.

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The Scientific Technical Library of the Institute had over 20,000 titles.

The main research themes of the institute are: use of high aluminum and magnesium content slags in blast furnace production; non-casting rolling of liquid pig iron; substitution of slightly annealed steels for expensive steels; improving the quality of steels by means of processing it with synthetic slags; utilization of new substitutes in friction couples; new shapes for rolling steel stock. In addition the institute consulted with various plants and industries with respect to the solution of their production problems.

A certain amount of difficulty was realized in the attempt to evacuate the institute, but by the beginning of 1942 the institute was once again carrying on its scientific research activities. The general research themes of the institute however were devoted entirely to military and defense needs. One of the most important projects had to do with improvement of the performance of the various metallurgical enterprises as well as improving the quality of metal products for defense purposes. Great and considerable research was conducted with respect to the determination of substitute materials for critically short materials.

One of the most important aspects of defense work was research to improve the plastic properties of plate special steel, particularly that special steel which was manufactured in large capacity martin furnaces. Prof Dr V. A. Mazharov conducting research with 185 ton martin furnaces found out that no matter how much gas is blown into the furnace only a limited amount is burned. This amount being determined by the area of the smelt. The Institute was able to develop a new shape for the "head" of the furnace thus providing for greater mixability of the gases and thus a greater amount of their combustion. The most important factor of this development was that the amount of fuel expended was greatly decreased.

- 20 -

CONFIDENTIAL

CONFIDENTIAL

Docent Ye. B. Kostyuchenko and his associates studied the possibility of utilizing large (300 ton) martin furnaces for smelting high quality steels, which had in the pre-war period been produced only in small furnaces. It was found that in large furnaces it was difficult to maintain high temperatures and Kostyuchenko was able to introduce methods for greater temperatures thus permitting mass production of high quality steels.

In addition there was the work which was done by Docent V. A. Aleksandrov who developed special shapes for the axles of war and military vehicles and machines.

One of the most important war time projects of the institute was the discovery of materials to substitute for some of the more critically short ferrous metals. The early loss of the 'Nikol' manganese deposits necessitated one of two possibilities: transportation of manganese ores from distant Chistov or effective exploitation of some of the small local deposits. At the Kuznets Order of Lenin Metallurgical Combine work was started on the large blast furnaces utilizing a method which had heretofore been used in the south on a method of smelting ferromanganese ores on a magnesium slag. Loss of manganese was lowered and a good iron alloy was produced.

On this same problem of finding methods for the conservation of manganese Engineer I. V. Malashenko, Prof N. F. Ieve and Prof V. L. Mozharov conducted laboratory experiments to determine methods for economizing on critically short manganese. It was discovered that phosphorus could be isolated from manganese ores thus permitting use of the relatively plentiful manganese-phosphorus ores.

Prof Ye. C. Shumovskiy conducted important research to determine substitute materials to be used in friction couples. In the prewar period work was under way in southern plants on the use of a substitute "Al'kasin" D for bronze and high tin content babbits. There was also introduced a new antifriction pig classed as

CONFIDENTIAL

CONFIDENTIAL

"KATIN" which was manufactured at southern plants. These substitutes were utilized at the Kuznets Metallurgical Combine. Nevertheless with the advent of hostilities attempts were made to use graphitized steels in friction couples (such steels could be rapidly produced at plants).

One important aspect of defense work is increasing the productivity of labor. With this in mind the Institute worked on various problems having to do with the mechanization of heavy and labor consuming operations. Much was accomplished in the field of mechanization of railroading operations. Engineers S. F. Mas'yanov and F. P. Chusov who worked on the problem of mechanization were awarded prizes of "Leaders of Socialistic Endeavour" by the people's commissariat of the ferrous metallurgy.

After the war the Institute began aiding in the reconstruction of demolished southern metallurgical plants. Much has been achieved with respect to the re-establishment of Donbass Metallurgical Plants. Scientific and technical help was extended to the rebuilding of the Yonakiev Metallurgical Plant. A special brigade was established to set up the rolling mills and determine methods for the control of the quality of the products. This group consisted of Prof V. A. Iiklov and Engineer V. L. Pisanko as well as several others who were also awarded the award of "Leaders of Socialistic Endeavour", by the People's Commissariat for Ferrous Metallurgy.

A group of steel smelting specialists of the Institute were sent to the Konstantinovka and Kramatorsk Metallurgical Plants. Special problems were met in regard to the efficient smelting of ores containing large amount of sulfur, and instructions were also given with respect to the martin furnace smelting of iron and steel scrap without pig.

A special group was sent to the Sulinsk Plant to improve operations of the Martin Furnaces. At the Voroshilov Metallurgical Plant another group worked out

22

CONFIDENTIAL

CONFIDENTIAL

solutions for problems connected to the production of various grades of steels and methods for maintaining the quality of these steel assets.

Special work is taking place at the Yenakiyev, Stalinsk and Makeyev plants on the organization of special laboratories as well as rendering instructions on methods for the control of the quality of the production.

At the same time major effort is being expended on the rebuilding of the laboratories and building of the Institute. Thus the effort of the Institute at the present (1944) time is taken up by rebuilding its facilities and aiding rear echelon industries in their problems of supply for the Red Army which with their help will soon vanquish the German foe.

POWER ENGINEERING INSTITUTE OF THE UKRAINIAN ACADEMY OF SCIENCES (Docent V. V. Karpenko)

During the period of the evacuation of the Institute a group of the associates of the Institute were working hard in the interests of national defense.

Some of the more important work had to do with hydrotransformers and hydro-couples (hydraulic clutches) for various vehicles and which were worked on by Academician G. F. Proskur. In spite of the fact that the equipment was in actual use no attempt had been made to explain the theoretical principles of these mechanisms. At the present time Proskur is working on the practical proof of his theories having to do with hydraulic clutches.

Another project had to do with the construction of small capacity water turbines for small capacity hydroelectric stations. A Francis type and propeller type of turbine were developed. In this research wide application was made of electric welding as a method for bonding various parts together. Every possible effort was made to find good substitute materials for critically short items.

- 23 -

CONFIDENTIAL

CONFIDENTIAL

Cand Tech Sci L. V. Tsukernik continued and developed work which had been started in connection with Academician V. M. Shushcheyev on theoretical problems of the compounding of synchronous generators with the aid of ordinary transformers. Practical application of the theoretical representations showed good results.

On the basis of experimental trials by the People's Commissariat of Power Stations USSR which were conducted with the assistance of the Power Engineering Institute of the Ukrainian Academy of Sciences special systems were developed with guaranteed against breakdowns in cases of compounded old as well as newly installed power systems.

Prof A. L. Matveyev studied the possibilities of rational schemes for power supply to industries operating under war time conditions. In addition he developed plans for wooden structures to house electrical distribution equipment. These wooden structures are painted with a special fire retarding silicon paint. Academician P. P. Rudnikov of the Bashkir Scientific Research Institute of Construction Materials conducted the tests on the paints which were produced from locally available materials. Additional tests on the fire proof nature of these wooden structures (painted with the special paint) were conducted at the Power Engineering Institute of the Ukrainian Academy of Sciences, and results were excellent. This fact is a boon to local building where lumber is plentiful. An additional advantage is in that the buildings do not require any foundations.

A. L. Matveyev's many years of research which were continued in the Urals at the Power Engineering Institute of the Ukrainian Academy of Sciences after their start at the Khar'kov Electrotechnical Institute are featured in a report on the work of the KhETI.

Associates of the Institute also worked out the most efficient methods for rationalization and reconstruction of the power systems for industrial enterprises.

- 24 -

CONFIDENTIAL

CONFIDENTIAL

After the liberation of the city of Kharkov in September 1943 the Kharkov branch of the Power Engineering Institute, Ukrainian Academy of Sciences returned and gave aid to the reconstruction of Kharkov power and electrical circuits. During the period September to November 1943 more than 130 power economies in the city of Kharkov were investigated preliminarily to their reconstruction.

At the present time intensive work is going on with respect to the installation of automatic regulation for the boiler units at T-10 KhZ and determining the static and dynamic reliability of Kharkov power and electrical systems.

PHYSICO-TECHNICAL INSTITUTE OF THE UKRAINIAN ACADEMY OF SCIENCES (Prof Dr A. K. Vasil'ner)

In the dark days of the German advance the workers of the institute were working 24 hours a day in their shops turning out vital defense items. Some of the personnel of the institute were turning out a new weapon identified as PV-UFTI developed by members of the Kriogenic Laboratory of the institute by Prof B. G. Lazarev and Sr Sci Associate V. I. Khotkevich and Sr Sci Associate Ya. S. Kan and which was utilized as a fuse to set into action so called anti-tank bottles (Molotov cocktails?). Other members of the institute were developing sights for mortars while yet another group working under Corresponding Member of the Ukrainian Academy of Sciences Prof A. A. Slutskiy of the Laboratory of Electromagnetic Oscillation were perfecting a new military machine which was to play an important part in the defense of Moscow. Almost simultaneously with the intensive defense production of the institute a group of hard working employees of the institute, deep in the interior of the institute were crating the valuable equipment of the institute.

- 25 -

CONFIDENTIAL

CONFIDENTIAL

Following the order to evacuate the institute moved its equipment to Alma-Ata some 4500 kilometers from Khar'kov into two rooms at the University at Alma-Ata and into one laboratory at the Pedagogical Institute at Alma-Ata. For a period of almost $2\frac{1}{2}$ years the displaced members of the institute worked on two main themes: 1- development of new types of equipment and military supplies and 2- technical assistance to Kazakhstan industries.

Members of the Laboratory of Electromagnetic Oscillation under the supervision of Corresponding Member of the Academy of Sciences Ukr SSR Prof A. A. Slutsky developed a special piece of equipment which proved invaluable in anti-aircraft defense.

Prof B. G. Lazarev and Senior Sci Associate Ya. S. Ka. and Sr Sci Associate V. I. Khatkevich developed a new weapon. In addition V. I. Khatkevich is supervising work on the development of new equipment.

Corr Member of the Ukr Acad Sci Prof K. D. Sinel'nikov and Prof A. R. Val'ter were able to work out methods for increasing the light intensity of optic devices.

Prof B. G. Lazarev developed a new anti-freeze for use in automobiles and airplanes which he submitted to the Main Administration on Supply of Fuel and Lubricants to the Red Army.

UFTI was very active in their aid to Kazakhstan industries. Kazakhstan is experiencing an intensive development of the metallurgical industry, with resulting supply of large amounts of valuable materials to the front. In spite of the fact that in the pre-war period UFTI had not considered problems having to do with non-ferrous materials. However in the intensive war effort, physicists of UFTI who have had considerable experience with studies of the atomic nucleus turned their efforts to helping the non-ferrous metallurgy combines and polymetallic mines in their problems for the discovery of substitutes for critical materials.

- 26 -

CONFIDENTIAL

CONFIDENTIAL

A Among those who were leaders in this field were Prof M. I. Kersunskiy, Prof E. G. Lazarev, Sr Sci Associates Ya. S. Yan, Sr Sci Asst S. S. Smulya, Sr Sci Asst T. A. Goloborodko.

One of the great shortages which made itself felt among the metallurgical plants was the shortage of calcium carbide. However mines started to produce carbide which was then processed in a series of enterprises. Important substitutes were found for critically short chemicals which were needed for the dressing and concentrate industry. Methods were improvised for decreasing the amount of waste at metallurgical plants. At the Chikent Tin plant a special system of spectral quantitative analysis was set up for tin and antimony.

Utilizing the principle of the measuring instrument, which is utilized in the study of the atomic nucleus the workers of UFTI were able to give to geologists a new sensitive surveying apparatus which permitted the identification and location of uranium deposits which had industrial value.

In addition the institute conducted some purely applied studies and worked on numerous theoretical problems.

Prof A. N. Akhiezer conducted some very thorough studies in the field of ferromagnetism and the theory of the solid body.

Prof I. M. Lifshits developed some generalizations of the theory of agitation and also showed the application of these theories for solving tasks of physics pertaining to real crystals.

Corr Memb of the Ukr Acad Sci Prof K. D. Sinel'nikov conducted theoretical and experimental studies on the deposition (precipitation) of thin layers of metals and insulating materials from molecular beams and also studied the optic properties of such layers.

- 27 -

CONFIDENTIAL

Sinel'nikov together with Prof A. B. Val'ter and Sr Sci Associate I. N. Golovin developed a new method for generating electromagnetic oscillations in the centimeter band. At the present time work is progressing on a practical utilization of this discovery.

Prof M. P. Korsunskiy, in connection with the work mentioned above, also developed a new method (or at least developed the theory for a new method) for the focusing of molecular beams and which should be of interest to those conducting work in the field of the study of isolating of isotopes.

It is interesting to note the achievements of the displaced institute purely as a accounting picture. The institute during its period of displacement held 20 scientific conferences at which time numerous reports were submitted, 35 doctorate's dissertations were heard, and three candidate's dissertations were made ready for presentation.

The Kazakhstan government praised the work of the IPTI workers highly, in fact 8 of its supervisory personnel were awarded awards of the Supreme Council, KazSSR.

In April 1944 the Institute returned to Khar'kov. The first task of the members of the institute was to repair the damage wreaked by the war. The first three months after the return were devoted to the reinstallation of an electrostatic generator used in the study of the atomic nucleus as well as equipment to be used in low temperature research. The members of the High Voltage Laboratory set before themselves the task of installing a 1¹/₂ million volt generator and to have it in operation by 23 August (the day of the liberation of Khar'kov-anniversary).

While the reconstruction is going on, personnel of the institute are conducting experiments in the field of electronics, electromagnetic oscillations, physics of solid bodies and nuclear physics. One of the most important post war developments of the institute has been the assembly of an apparatus which permits the identification of breaks in electrical circuits.

- 28 -
CONFIDENTIAL

CONFIDENTIAL

SCIENTIFIC RESEARCH INSTITUTE OF GEOLOGY, KHARKOV STATE UNIVERSITY (Honored Worker of Science Prof D. N. Sobolev)

The primary work of the Institute was directed toward rendering the Red Army a service by describing the geology, geography, geomorphology and engineering hydro-geological characteristics of terrain (particularly terrain on both banks of the Dnepr River). However with the separation of the front and Kharkov the Institute gradually undertook other duties. On 16 October 1943 the scientific research Institute of geology was reactivated by decree of the War Commissariat USSR and given the task of conducting scientific geophysical and geological work for petroleum deposits in the territories of the Great Donbas region. In connection with this new assignment the Institute formed two new sectors: Geophysics and Geochemistry and assigned leading specialists in the respective fields as chiefs of the sectors. The various instructors and professors of the Geology-Geographical Faculty of the Institute have been placed in one building (heretofore they were scattered throughout the Institute). Much of the necessary equipment (microscopes and theodolites etc) which was taken by the Germans was put at the disposal of the revitalized Institute by similar institutes and VUZ's of Moscow and Voroshilovgrad. The Institute by itself developed special equipment, such as apparatus for the surveying of mineral deposits by utilizing acoustic oscillation.

In spite of the handicapped position of the Institute several reports have been written on the problem of petroleum in the Amadotsiyskiy basin (Bol'shoy Donets), on the state of petroleum in the Romenskiy petroleum deposits, on geophysical surveys in the area of the Sinevskiy cupola and the necessity for further test drilling in that region. Among the reports were "Sinevskiy Salt Cupola and Its Geological Classification"; "The Problem of Petroleum in the Ukraine and Its Relationship to the Work of the Geology Institute, Kharkov State University"; "The By-Products of Dnepro-Donets Petroleum".

- 29 -

CONFIDENTIAL

CONFIDENTIAL

Members of the Institute together with associates of the Geologo-Geographical Faculty have completed a work "Khar'kov Oblast" in which they give a geological and geographical picture of the oblast. A similar work "Dumakiy Oblast" is scheduled for completion in 1945.

Thus it can be seen that problems of petroleum are the major research theme of the Institute. Geographical studies are centered on the immediate Khar'kov area and the Donbass region, but studies have also been conducted on many areas far from the city of Khar'kov.

In addition to its main themes of research the Institute on request of the party and state took active part in the reconstruction of the city of Khar'kov. A special map was prepared on order of the Khar'kov Oblast Executive Committee showing Khar'kov Oblast and its mineral deposits, on a special order from Khurgaz the Institute prepared a report identifying the deposits of low grade iron ores in Khar'kov Oblast, PVKH received information on dolomite deposits in Khar'kov Oblast, various construction enterprises were informed as to the quality of the local construction sands, special research was conducted to determine the possibility of the Izyum Glass Factory utilizing locally available quartz sands.

The Institute also published numerous articles and books on its activities during the war as well as the period immediately following the war: "Geology during World War II", "Petroleum and War", "Mineral Resources and the Part they will Play in the Reconstruction of the Khar'kov Industries".

KHAR'KOV ORDER OF LABOR RED BANNER AGRICULTURAL INSTITUTE (Docent N. K. Krupskiy)

On the very eve of World War II the Institute celebrated its 100 anniversary of existence as one of the oldest agricultural VIZs in the USSR. The Institute was originally lead by V. V. Dokuchayev (deceased). As a result of the great achievements of all the members of the Institute the Institute was given the honor of bearing the title "Order of Labor Red Banner".

- 30 -

CONFIDENTIAL

CONFIDENTIAL

With the opening of hostilities the institute was moved to Katta-Kurgan where more than 100 young specialists continued the scientific research work of the institute. It was during this period of evacuation that new methods for the culture of the sugar beet were developed and introduced to agriculture.

The Chair of General Farming (Docent A. M. Grischenko) conducted important work leading to many interesting theoretical and practical results: showed the great effect of animal fertilizer if applied properly, (particularly in sugar beet culture) for agriculture in the irrigated regions of Katta-Kurgan. He also studied the effects of cultivation without going too deep as well as the various advantages to be gained by having deeper irrigation canals.

Prof T. D. Strashov developed a new type of "kagat" for storing sugar beets at lowered temperatures.

Acting Docent B. I. Sarana devised a method for seeding sugar beet from a U-1 tractor which was proceeding in third speed. It was also established that certain advantages were to be obtained as a result of the "best" planting of sugar beet seeds.

Docent G. U. Rodoly of the Chair of Animal Husbandry studied the possibility of utilizing local feeds for animal husbandry in the Katta-Kurgan region.

Docent A. M. Mozheyko of the Chair of Soil Studies studied the physico-chemical aspects of the formation of soil crusts on the sero-zems of the Uzbek SSR. Some new theories were advanced with respect to the formation of this crust and several new methods were recommended for the control of this crust. Prof S. M. Muravlyanskiy, Chief of the Chair of Physics aided in this research and submitted some valuable theories with respect to the effect of humidity and some mineral fertilizers on the compactability and bonding qualities of Uzbek SSR sero-zems.

- 31 -

CONFIDENTIAL

CONFIDENTIAL

Prof F. F. Matskov of the Chair of Plant Physiology established the possibility of controlling the activity trend of sucrose (and incidentally of other ferments) in the leaves of the sugar beet. It was shown that the application of nitrogen sub-soil surface would bring about a synthetic control over the action of sucrose, while a sub-soil surface feeding with phosphorus resulted in a hydrolytic reaction. It was thus determined that there exists the possibility not only of controlling the growth of the sugar beet but also the control of the process of collecting sugar.

Prof V. G. Averin conducted important research on the analysis of ecological variations caused by the introduction of new cultures. He conducted materials on 19 different types of cultures, and conducted tests on inventarization of ento (endo) parasites, their biology and their control (standard methods of control as well as new methods developed by the Chair of Entomology of the Kharkov Agricultural Institute (KhSKAI). Special method involving increased dosages of sodium arsenate were suggested by M. I. Shul'ina as a method for controlling the dangerous sugar beet parasite the sugar beet caterpillar. Prof V. G. Averin of the Chair of Zoology and Entomology perfected a method for distributing toxic dusts for agricultural purposes by utilizing planes.

Docent Ye. A. Alekseyeva and Senior Lab Technician A. K. Frank worked on the comparative evaluation of methods for the determination of sugar content of roots of sugar beets. Thus it can be seen that the primary research theme of the institute has been in relation to the introduction of the new agricultural item - the sugar beet to Uzbekistan.

The second great research theme, which was placed at the doorstep of the institute on special request of the Central Committee Communist Party (B) Uzbek and the Council of People's Commissars Uzbek SSR was the determination of methods for

- 32 -

CONFIDENTIAL

CONFIDENTIAL

increasing the cotton yield. In Uzbekistan cotton is attacked by various diseases and in some instances the harvest is all but completely ruined. Prof T. D. Strakhov conducted a series of experiments at Katta-Kurgan kolkhozn on the value of a desorption-gas method for intercalating seeds as well as effective methods for the disinfection of soil as a method for controlling "gommoz" and wilt. It was determined that the desorption gas method saved 8 times an amount of formalin while increasing the harvest by almost 50%. Local desorption gas treatment of soils decreased wilt incidence by 2 to 3 times and increased harvest by 21%.

The extensive national economical projects which have to be accomplished in the Uzbek republic also demand an intensive expansion of the animal husbandry industry. The Sharikov Agricultural Institute took active part in the solution of various problems relative to this expansion. Docent G. G. Podoba conducted a statistical survey in Katta-Kurgan region for the year 1942 and also examined the animal husbandry plan for 1943 and came up with some very helpful ideas with respect to increasing the yield of animal husbandry.

At the Chair of Botany of the Institute, Docent N. D. Byzhutin and Docent A. D. Alekseyeva conducted floristic and ecobotanical studies of the plant life around Katta-Kurgan region and gave a typological description of the natural feed regions of that region (taking into account both naturally productive and irrigated regions). They also suggested methods for the rational utilization of pasture lands, and were able to compile an atlas showing both the valuable and toxic plants and shrubs and their habitat.

Some mention must also be made of the valuable work conducted at the Chair of Selection and Seed Studies (Dep of Chair, Prof L. M. Delone) where after two years of intensive work by Delone it was possible to obtain two hybrid types of winter wheat.

- 33 -

CONFIDENTIAL

CONFIDENTIAL

Great practical significance can be attached to the work of the Chair of Phytopathology (Prof T. D. Strakhova and Aspirant E. V. Radenko) on definition of regularities in the process of degeneration of the "head" forming agents for grain crops, in the soil. It was established that under conditions such as are found in the Uzbek SSR the process of degeneration of grain "head" forming agents is about twice as fast as the degeneration in the Ukraine.

In addition to research in the agricultural field, the Institute also did much valuable work with respect to the defense projects which were carried out in the Uzbek SSR.

On order of the People's Commissariat of the Petroleum Industry USSR at two of the oil producing regions in central Asia experiments were conducted on the possibility of utilizing earthen storage tanks for petroleum products. The theory was supplied by Academician A. M. Sokolovskiy, while the practical aspects were worked out by Docent N. K. Krupskiy. Others who took part in this project were Docent A. M. Grinchenko and A. M. Koznyko. General supervision of this project was had by Academician Sokolovskiy.

In addition the so-called saliniferous coverings which Academician Sokolovskiy suggested for the storage of petroleum products was applied to other structures.

This work on saliniferous earth containers and structures was subjected to testing in laboratories of the Chair of Soil Studies, Kharkov Agricultural Institute.

For the completion of this work the Institute and Docent N. K. Krupskiy were thanked by Academician A. Ye. Fersman, Chairman of the Commission on Geologo-Geographical Service to the Red Army, Academy of Sciences USSR.

- 34 -

CONFIDENTIAL

CONFIDENTIAL

After the liberation of the city the Institute returned as rapidly as possible to start reconstruction operations. By November 1943 some attempts had already gelled with respect to the giving of four regular courses. Also during November the Central Committee of the Communist Party (B) requested the Institute to start courses for farmers. In one month more than 1410 students were accepted for these special courses.

In addition to aiding the reconstruction of the national economy of the area by means of the device of training personnel some very actual aid was given to the reconstruction of Murkov Industrial agencies. The Institute conducted a series of discussions with various industries in the Sapozovich district and special help was given to over 227 farms and agricultural agencies with respect to farming. Special farm aid was given by Prof Dr A. A. Migulin, Docent G. A. Trunov, Docent N. K. Krupskiy, Docent I. L. Kolesnik, Prof I. M. Kletskiy and others.

At the present time N. K. Krupskiy is supervising a group of workers who are trying to adapt methods recommended by Academician A. M. Sokolovskiy for the manufacture of barrels for the storage of vegetables.

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- 35 -

CONFIDENTIAL